Where is CM and DM in DODD 5000.1

Presented 2-4 March 2005
Dr. Jay Billings

(c)2005 Defense Sytst
ems Management Corpor

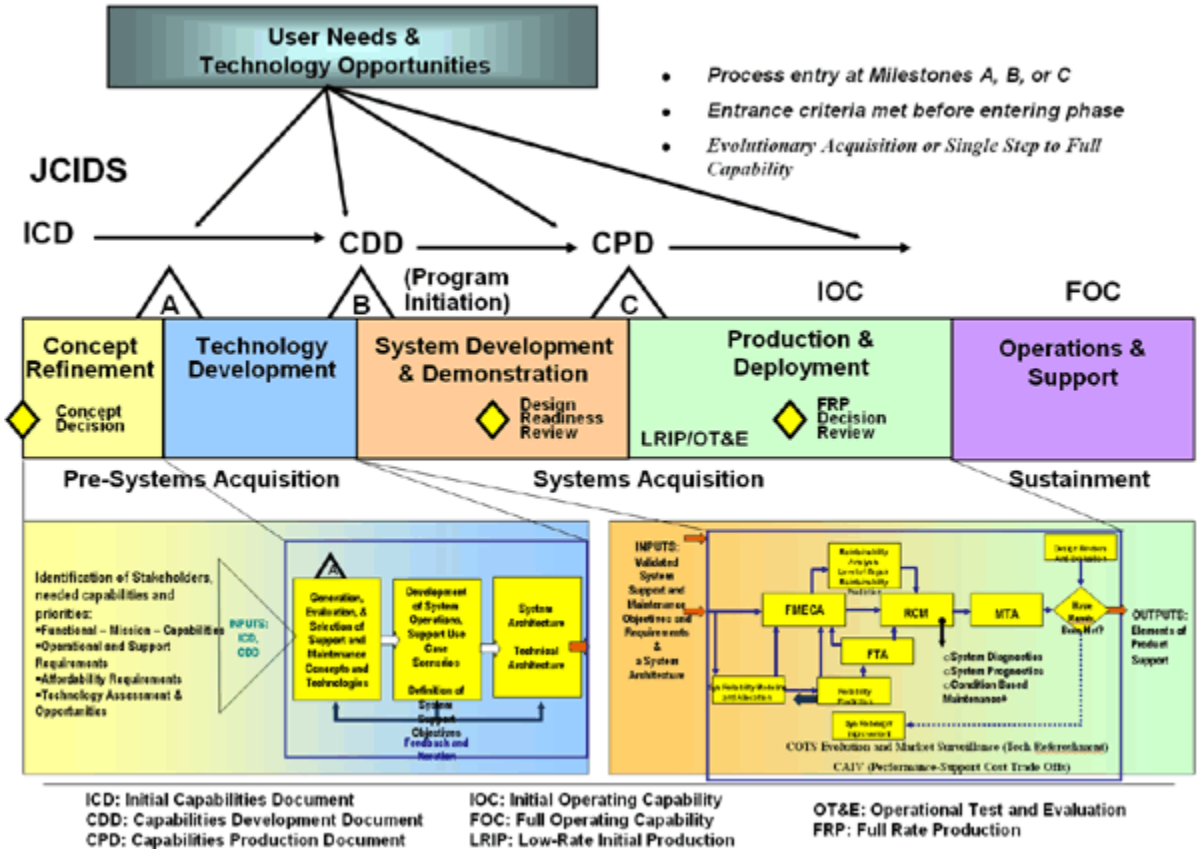
What is Dodd 5000.1

- The Federal Government uses a “gated decision” or milestone approach to management of large acquisitions
  - **OMB Circular A-109**
  - **DoDD 5000.1**
- Key elements are
  - Single point of authority and responsibility
  - Decisions made at major life cycle milestones
  - There are **technical** and **budgetary** milestones
    - Technical = feasible
    - Budgetary = affordable

What is the overall DODD Life Cycle Management Approach?

- The Defense Acquisition System exists to manage the Nation's investments in technologies, programs, and product support necessary to achieve the National Security Strategy and support the United States Armed Forces.

Overall View



(c)2005 Defense Sytst
ems Management Corpor

Full Spectrum Analysis

W⁴H Mode

What

Threat
Capability gaps
- Present
- Projected future

Technology applicatio

Specific core deficiencies, problem areas, or opportunities stated as single issues

Who

Doctrine
- Strategy
- Policy
- Goals & Objectives
- Plans & Procedures

Organization
- Ownership of Assets
- Decision Authority
- Command relationships

Material
- Comm. interfaces

Training
- Competencies
- Knowledge
- Skills
- Abilities
- New schools
- Process

Personnel, Facilities
- Support Needs

Organization setting. Which organizations interface with the system? Address interfaces with other Joint Systems. Who will use the system when it is developed and fielded?

When

Programmatic
- Milestones
- Time frames
- Deadlines
- Deliverable dates
- FOS Synchronization
- P³I
- Time phasing
- Spiral acquisition
- Spiral development

Operational
- Phases of campaign
- IOC
- Deployment process

Time frames that will support acquisition approach. Milestones and.or dates to be delivered and fielded. Also consider phases of campaign

Where

Place on the battlefield
- Mobility
- Accessibility
- Survivability

Physical Environment
- Facilities
- Terrain
- Weather & climate

Theater specific considerations
- Supplies
- Transportation
- Deployment
- Installation
- Network
- Maintenance
- Civil considerations

The system's place on the future battlefield. Consider physical environment.

How

Doctrine
- TTP
- OPLANS
- Military conditions
- ROE

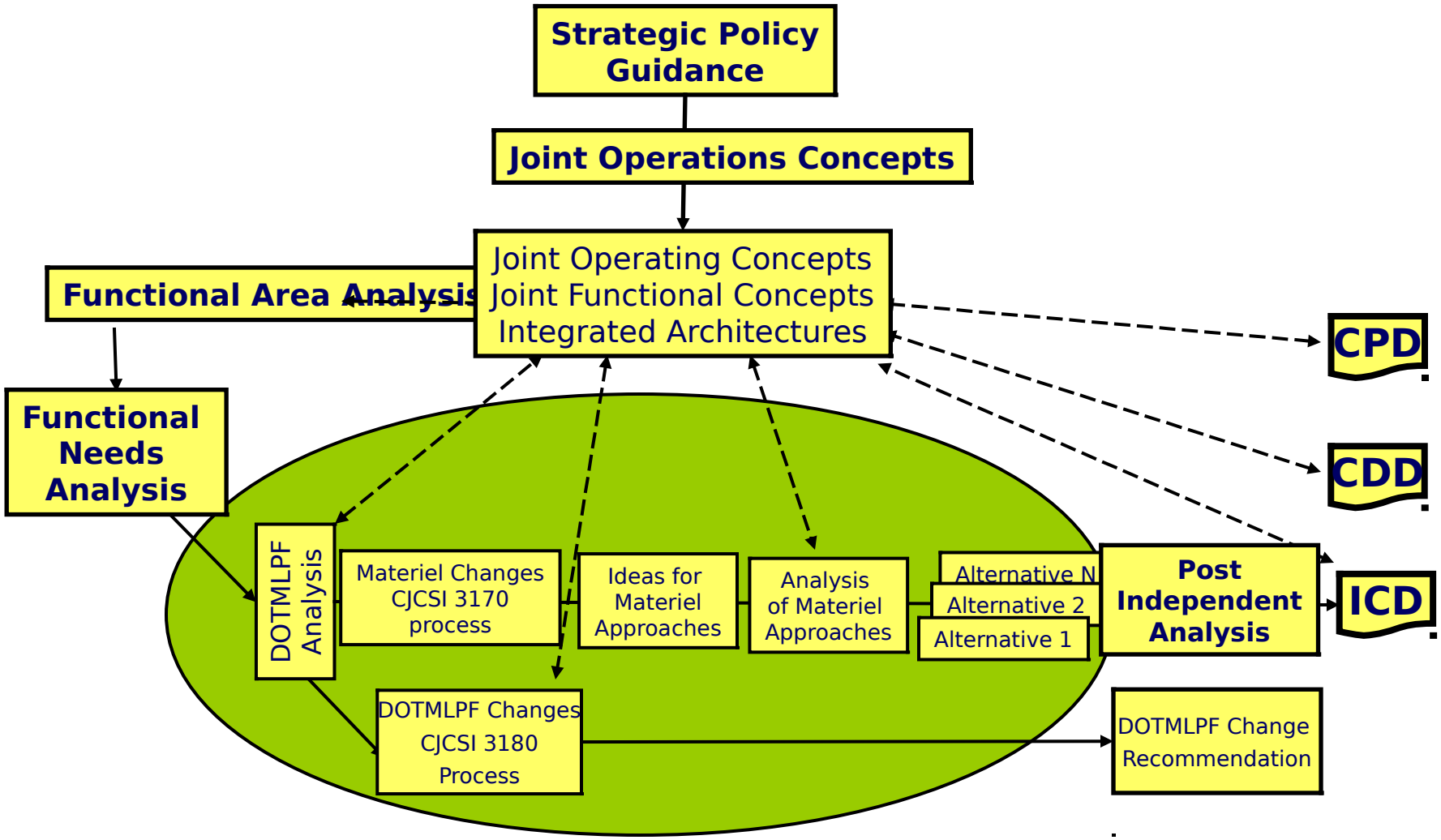
Leadership
- Decision Support
- Information Mgmt
- Deployment

Material
- Network
  - Design
  - Implementation
- FOS Integration
- Performance

Personnel
- Performance

Employment operation. How will the system be used to attain present and current future military objectives? Consider conditions under which the system will be used.

JCIDS Analysis



Functional Solution Analysis

(c)2009 Defense Systems Management Corpor

Functional Capabilities Boards

- **Responsibilities**

- Ensure new capabilities are conceived and developed in joint warfighting context
- Ensure JCIDS proposals are consistent with integrated joint force
- Validate Joint Impact proposals
- Organize, analyze & prioritize capabilities proposals
- Oversee development and update of Functional Concept(s)
- Ensure integrated architectures (as available) reflect functional area

- **Status**

- **5 Chartered by JROC:**
  - **Command & Control (JFCOM);**
  - **Battlespace Awareness (J2);**
  - **Force Application (J8);**
  - **Focused Logistics (J4)**
  - **Protection (J8)**

More Efficient Use of Scarce Department Resources

JCIDS Documents

- Capability Development Document (CDD)
  - **Replaces ORD at Milestone B**
  - Identifies operational performance attributes of proposed system
  - System specific, applies to single increment (in an evolutionary program)
  - Results from Technology Development and supports Milestone B
- Initial Capabilities Document (ICD)
  - **Replaces MNS**
  - Identifies a capability gap or other deficiency
  - Describes evaluation of DOTMLPF approaches
  - Support Analysis of Alternatives (AoA), Concept Refinement and Milestone A
  - Not updated once approved
- Updated or rewritten for subsequent increments

(c)2005 Defense Sytst
ems Management Corpor

JCIDS Documents (cont'd)

- Capability Production Document (CPD)
  - **Replaces ORD at Milestone C and FRPDR**
  - Identifies production attributes for a single increment of a program
  - Prepared during System Development and Demonstration
  - Rewritten for each increment in an evolutionary program
- Capstone Requirements Document (CRD)
  - **No Near Term Change**
  - Describes overarching thresholds/goals and standards in functional areas
  - Useful for family-of-systems or system-of-systems approaches
  - Developed only at JROC direction
  - Eventually will be replaced by integrated architectures

(c)2005 Defense Sytst
ems Management Corpor

Increased Flexibility

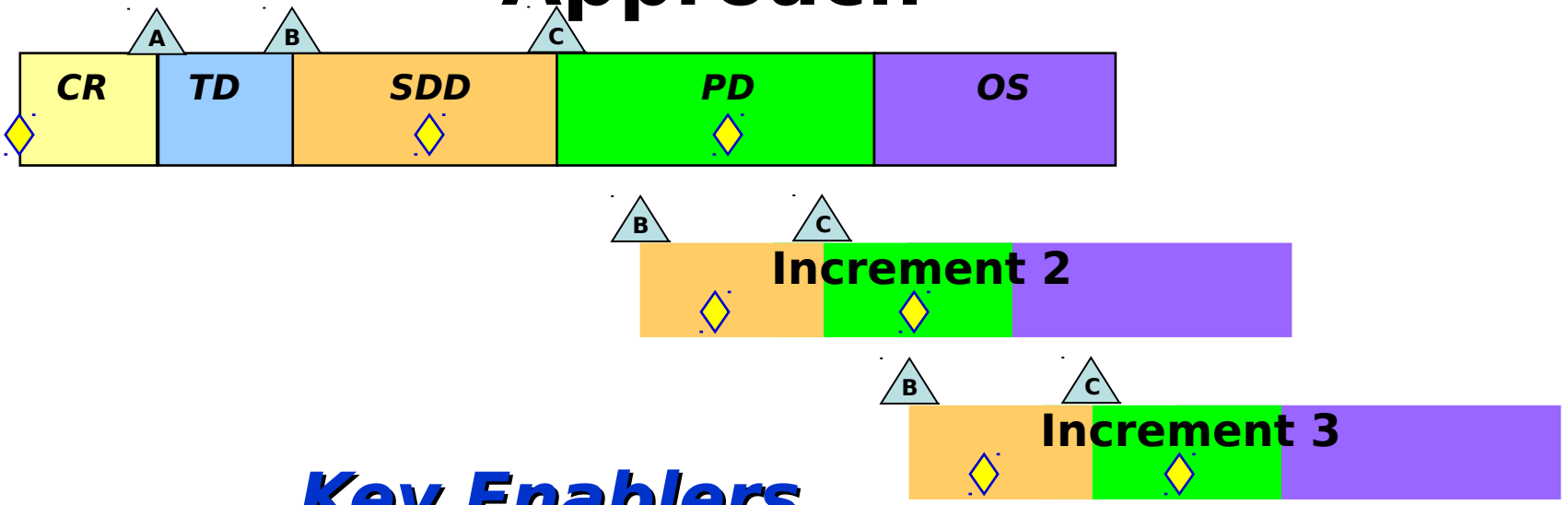
- **PM determines what information is required to satisfy regulatory requirements**
- **MDA may tailor (with some exceptions) regulatory information requirements**
- **MDA resolves issues regarding Guidebook expectations**

The Opportunity to Be Innovative

DEFENSE SYSTEMS MANAGEMENT CORPORATION

-

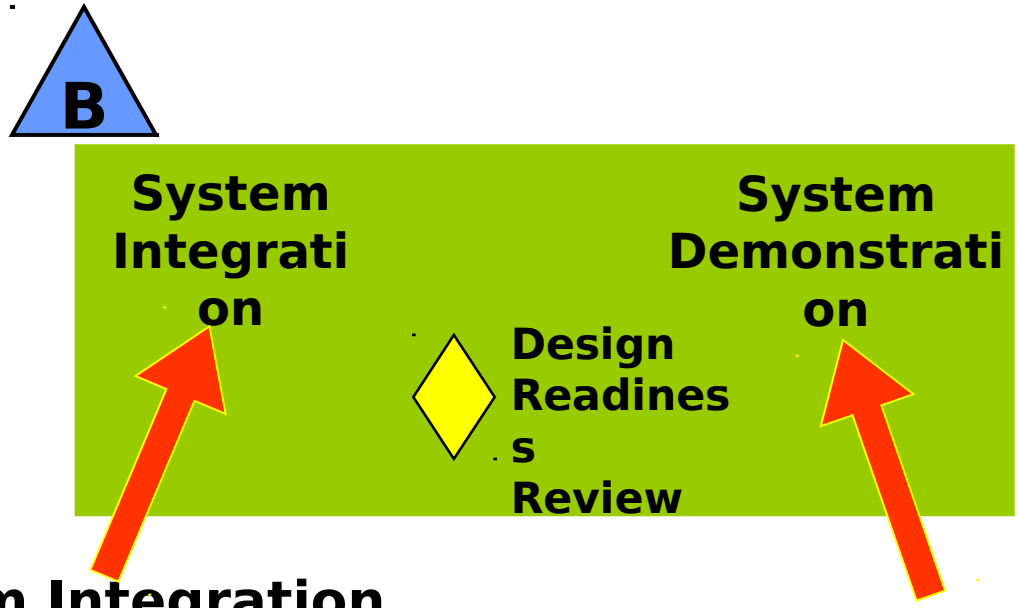
Evolutionary Approach



Key Enablers

- **Time-Phased Requirements**
- **A Modular Open Systems Approach to facilitate Technology Insertion**
- **Evolutionary Sustainment Strategies**
- **T&E Consistent with Evolutionary Approach**
- **Full Funding**

System Development & Demonstration



System Integration

Enter: PM has technical solution but has not integrated subsystems into complete system; approved CDD

Activities:

- System Integration of demonstrated subsystems and components
- Reduction of integration risk
- DT/EOA/preliminary LFT&E

Exit: Demonstration of prototypes in relevant environment

System Demonstration

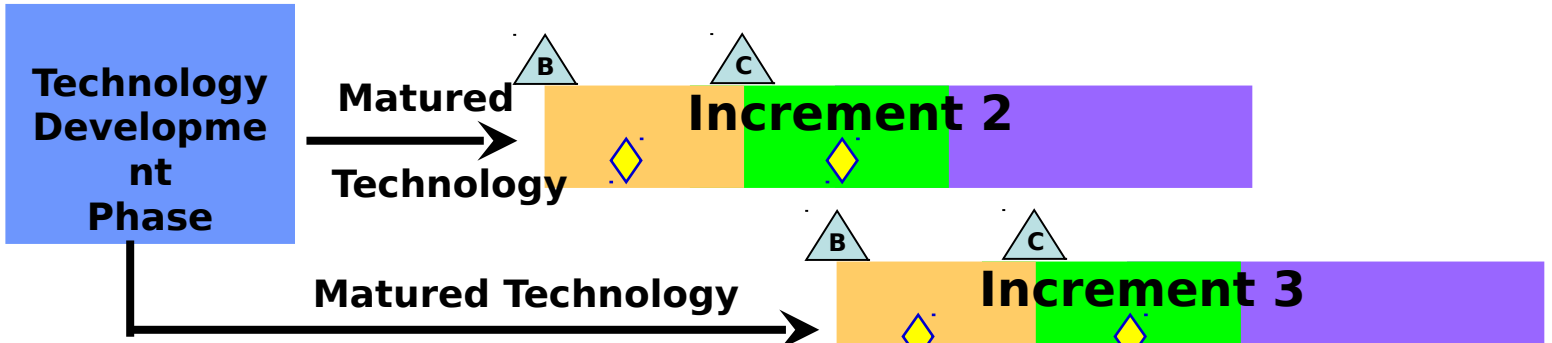
Enter: Prototypes demonstrated in intended environment

Activities:

- Complete system demonstration
- DT/OA/OT and preliminary LFT&E

Exit: System demonstration in intended environment using engineering development models; meets validated requirements

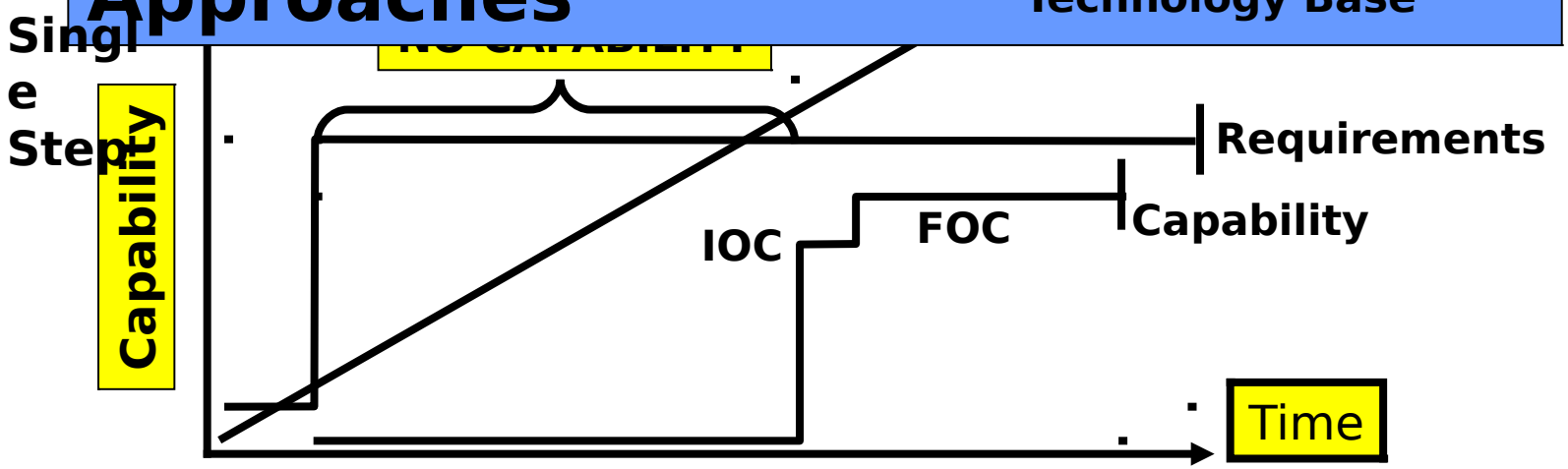
Each EA Increment Must Have…

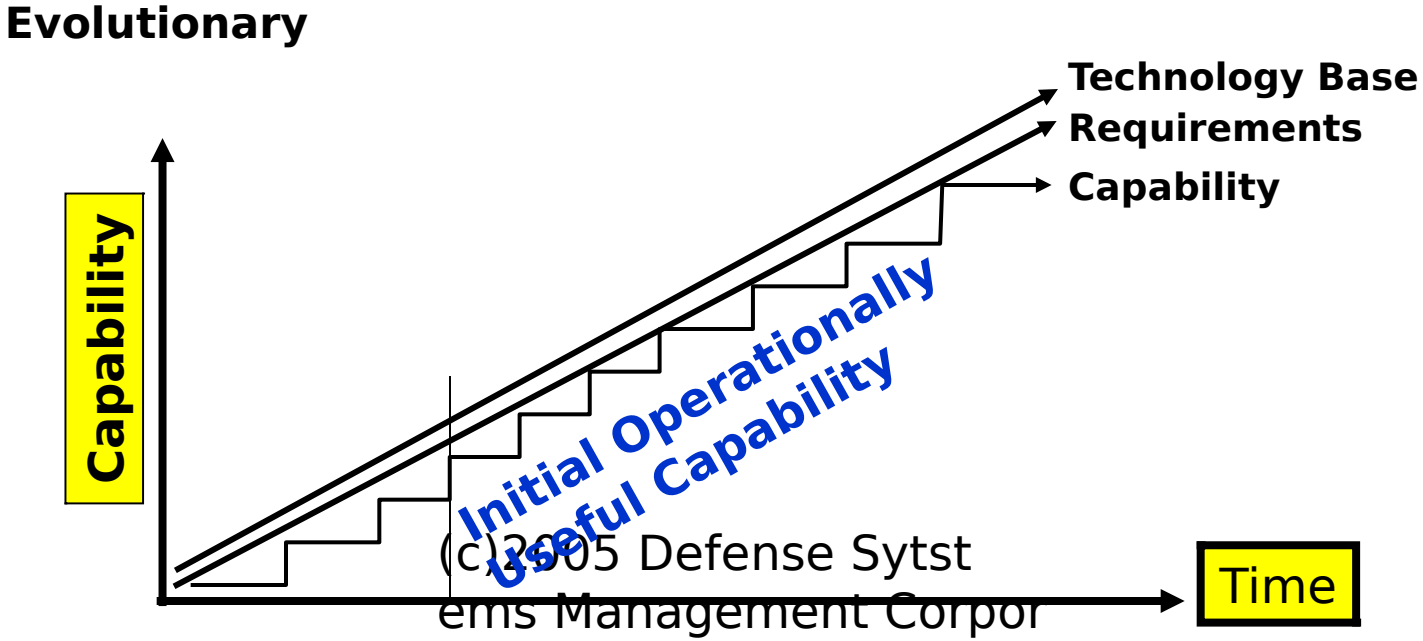


- **Milestone B & C**
  - Capabilities Development & Production Document (CDD/CPD)
  - Performance, Cost and Schedule Goals (Acquisition Program Baseline)
  - Operational and Live Fire Testing (If Required)
  - Compliance with Acquisition Oversight Requirements
    - Acquisition Strategy that reflects consideration of:
      - Logistics Planning;
      - Manpower, Personnel and Training;
      - Environmental and Security Factors;
      - Protection of Critical Program Information;
      - Spectrum Management
      - Other information tailored to the conditions of the program

Increments are Related, but Separate Acquisitions

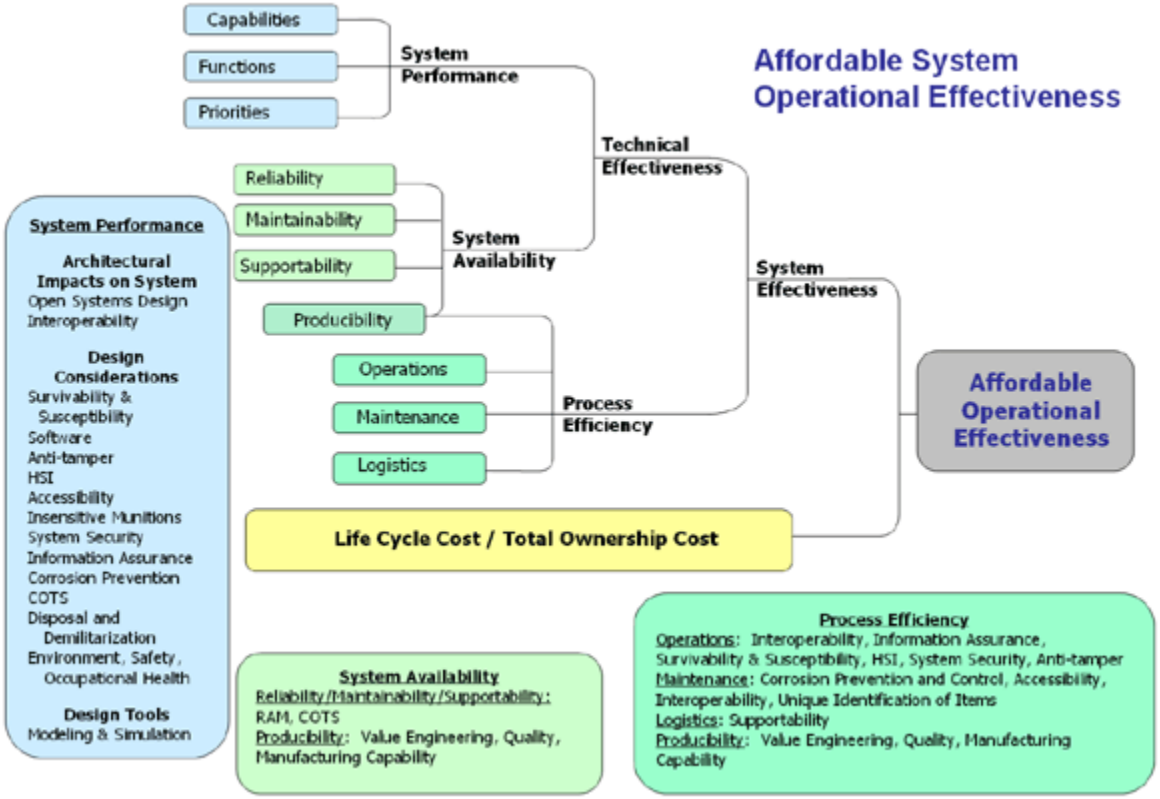
Single Step & Evolutionary Approaches





(c)2005 Defense Sytst
ems Management Corpor

Where do CM and DM appear?



DEFENSE SYSTEMS MANAGEMENT CORPORATION

The DoDD described system Conflicts with Easy CM/DM

Time-Phased Requirements	INSIDE CHANGE
A Modular Open Systems Approach to facilitate Technology Insertion	INSIDE CHANGE
Evolutionary Sustainment Strategies	INSIDE CHANGE
T&E Consistent with Evolutionary Approach	OUTSIDE CHANGE
Full Funding	NEVER HAPPENS

Where is CM in DoDD 5000.1?

- DoD 4120.24-M, the Defense Standardization Program (DSP)

  Policies and Procedures, there are only two classes of standards and specifications to be considered: those that may be used with no restrictions and those documents requiring waiver prior to application.
- Defense Standardization Program Policies and Procedures Paragraph C3.8.2. of DoD 4120.24-M lists nine types of documents that may be used in development contracts. Of particular interest are three military document types: **standard practices**, **interface standards, and defense standards.**

CM and DM are in Dodd 5000.1, but are subsets of other Systems Management Topics

- Technical Management
- Risk Management
- Interface Management

Standards

- *ANSI/EIA 649A, Configuration Management*, on the GEIA website (Click on STANDARDS);
- *ISO 10007, Quality Management - Guidelines for Configuration Management*;
- *EIA 836, Configuration Management Data Exchange and Interoperability*, located on the GEIA website (Click on STANDARDS); and
- *MIL-HDBK-61A, Military Handbook, Configuration Management Guidance*

- ISO/IEC 15288, *Systems Engineering-System Life Cycle Processes*
- ANSI/EIA 632, *Processes for Engineering a System*
- IEEE 1220, *Application and Management of the Systems Engineering Process*
- EIA 731, *Systems Engineering Capability Model*
- CMMI SWE/SE/IPPD/SS, *Capability Maturity Model-Integration for Software Engineering, Systems Engineering, Integrated Product and Process Development and Supplier Sourcing*
-

- **4.6.2.Handbooks and Guides**
- *Guidance for the Use of Robust Engineering in Air Force Acquisition Programs*
- *Navy Systems Engineering Guide*
- INCOSE Handbook
- MIL-HDB-61, *Configuration Management*
- MIL-HDBK 881, *Work Breakdown Structure*
- MIL-HDBK 1785, *Systems Security Engineering*
- *NASA SE Handbook*
- *DSMC Systems Engineering Fundamentals*
- *DAU Risk Management Handbook*
- *Product Support for the 21st Century: A Program Manager's Guide to Buying Performance*
- *Designing and Assessing Supportability in DoD Weapon Systems: A Guide to Increased Reliability and Reduced Logistics Footprint*
- *DoD Template for Application of Total Life Cycle Systems Management (TLCSM) and Performance Based Logistics (PBL) In the Weapon System Life Cycle*
- *DoD Guide for Uniquely Identifying Items*
- The Reliability Analysis Center is a DoD Information Analysis Center, a Center of Excellence, and a technical focal point for information, data, analysis, training and technical assistance in the engineering fields of Reliability, Maintainability, Supportability, and Quality. Their web site is http://rac.alionscience.com/
- ISO/IEC TR 19760, *Systems Engineering – A guide for the application of ISO/IEC 15288 (System Life Cycle Processes)*, First Edition, 2003-11-15

Places where Standards CM and DM should be found

- Acquisition Strategy
- Product Support Strategy
- Statutory, Policy and Guidance Factors
- Acquisition Program Baseline
- Test Evaluation Master Plan
- WBS

Places where Standards and CM and DM should be found

- DoD 5000.1 and DoDI 5000.2 may not mention CM and DM specifically, but they do require several documents that allow for the application of CM and DM.
- This application is subject to tailoring and may be deleted, or incorrectly included.

DEFENSE SYSTEMS MANAGEMENT CORPORATION

- Why should we include CM and DM in DoD major acquisitions?
  - Makes sense to do it
  - They are fundamental management tools for systems management and for engineering management.
- Why exclude CM and DM from DoD major acquisitions?

- Why exclude?
  - They are alleged to “cost money”
  - They cause system to lose flexibility by forcing discipline too early
  - They do not allow for quick changes to reflect
    - mission changes
    - requirements changes
    - technology changes
    - they show responsibility and support accountability.

DEFENSE SYSTEMS MANAGEMENT CORPORATION

- Why include?
  - Increases knowledge
  - Avoids restarts and duplicative efforts
  - Assigns responsibility and accountability

- Where it can be used
  - Analysis of alternatives (Chapter 3 DoDI 5000.2)
  - System Engineering Plan (Chapter 4 DoDI 5000.2
  - Test and Evaluation Master Plan (Chapter 9 DoDI 5000.2)

Why CM and DM

- How can CM and DM be “sold”?
- One must describe the
  - Features--
  - Benefits--
  - Proof

DM Standards

- *S1000D International Specification for Technical Publications Utilizing a Common Source Database;*
- *Data Management Community of Practice (CoP), located on the Acquisition Community Connection on the DAU website;*
- *DoD 5010.12-M, Procedures for the Acquisition and Management of Technical Data, May 1993;*
- *DoD 5200.1-M Acquisition System Protection Program, March 1994;*
- *GEIA-859, Consensus Standard for Data Management,* located on the GEIA website (Click on STANDARDS). (Note: This document is currently being published.);
- *Intellectual Property: Navigating Through Commercial Waters, October 15, 2001,*
- *ISO 10303, Standard for the Exchange of Product Model Data (STEP), website*

DEFENSE SYSTEMS MANAGEMENT CORPORATION

DoDI 5000.2
DM Requirements

- The applied systems engineering process requires *access* to data to facilitate decision making, but does not necessarily require *acquisition* of *all* data. The data management processes assist in decision-making. Data management processes reveal the proper data to be acquired or accessed. The decision to purchase data should be made when access to required data is not sufficient to provide for Life-cycle planning and system maintenance. The cost of data delivery should be a primary consideration. Other considerations include the following:
- Data requirements for spare and repair parts;
- Technical data needed for ordering and purchasing items for contingencies; and
- Circumstances under which the data may evolve over time to more useful or updated data.

DEFENSE SYSTEMS MANAGEMENT CORPORATION

DoDI 5000.2
DM Requirements

- **4.2.3.7.3.Data Storage** The program manager also has responsibility for addressing long-term storage and retrieval of data and associated program information - planning for digitizing continued need information, as appropriate and cost-effective. Such long-term planning and incremental digitization, as required, will assure that applicable data is available, preserved, and migrated to successive formats for future planning and use.

DoDI 5000.2
DM Requirements

- **Key Logistics activities that must be completed before MS B:**
- · Preparation and/or assessment of sustainment planning and parameters in the
- Capabilities Development Document (CDD)
- · Description of the product support strategy as documented in the Acquisition
- Strategy (ASR)
- · Description of the appropriate logistics metrics, criteria, and funding
- requirements in the Acquisition Program Baseline (APB).
- · Description of the appropriate logistics considerations and test points in the Test
- and Evaluation Master Plan (TEMP)

- The following LCL ‘drivers’ should be considered in the Initial Capabilities Document :
- System Maintenance/Support Profiles and Use Case Scenarios (Support Capability Packages)
- Reliability and Maintenance Rates
- Support Environment and Locations for Support
- Support and Maintenance Effectiveness
- Duration of Support

DoDI 5000.2 DM Requirements

- Cost Analysis
  - Lifecycle Cost Methodology
  - Models and Data
  - Cost Sensitivity and/or Risk Analysis
- Cost-Effectiveness Comparisons
  - Cost-Effectiveness Methodology
  - Displays or Presentation Formats
  - Criteria for Screening Alternatives
- Organization and Management
  - Study Team/Organization
  - AoA Review Process
  - Schedule

Case 1: Requirements
What are the major CM and DM issues
for a requirement for “germ/virus resistant clothing”

- CM

1

2

3

- DM

1

2

3

DEFENSE SYSTEMS MANAGEMENT CORPORATION

What should be in your proposal
for the Germ/Virus Resistant Clothing?

- CM

1

2

3

- DM

1

2

3

What are good metrics to show CM and DM is being used on a Project/Program?